



DC (10–30V) Output Module

Cat. No. 1771–OVN Series B

To The Installer

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Important User Information

Because of the variety of uses for the products described in this publication, those responsible for the application and use of these products must satisfy themselves that all necessary steps have been taken to assure that each application and use meets all performance and safety requirements, including any applicable laws, regulations, codes and standards. In no event will Rockwell Automation be responsible or liable for indirect or consequential damage resulting from the use or application of these products.

Any illustrations, charts, sample programs, and layout examples shown in this publication are intended solely for purposes of example. Since there are many variables and requirements associated with any particular installation, Rockwell Automation does not assume responsibility or liability (to include intellectual property liability) for actual use based upon the examples shown in this publication.

Allen–Bradley publication SGI–1.1, Safety Guidelines for Application, Installation, and Maintenance of Solid–State Control (available from your local Rockwell Automation office), describes some important differences between solid–state equipment and electromechanical devices that should be taken into consideration when applying products such as those described in this publication.

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Throughout this publication, notes may be used to make you aware of safety considerations. The following annotations and their accompanying statements help you to identify a potential hazard, avoid a potential hazard, and recognize the consequences of a potential hazard.

WARNING

Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.

ATTENTION

Identifies information about practices or circumstances that may lead to personal injury or death, property damage, or economic loss.

IMPORTANT

Identifies information that is critical for successful application and understanding of the product.

ATTENTION**Environment and Enclosure**

This equipment is intended for use in a Pollution Degree 2 industrial environment, in overvoltage Category II applications (as defined in IEC publication 60664–1), at altitudes up to 2000 meters without derating.

This equipment is considered Group 1, Class A industrial equipment according to IEC/CISPR Publication 11. Without appropriate precautions, there may be potential difficulties ensuring electromagnetic compatibility in other environments due to conducted as well as radiated disturbance.

This equipment is supplied as “open type” equipment. It must be mounted within an enclosure that is suitably designed for those specific environmental conditions that will be present, and appropriately designed to prevent personal injury resulting from accessibility to live parts. The interior of the enclosure must be accessible only by the use of a tool. Subsequent sections of this publication may contain additional information regarding specific enclosure type ratings that are required to comply with certain product safety certifications.

See NEMA Standards publication 250 and IEC publication 60529, as applicable, for explanations of the degrees of protection provided by different types of enclosures. Also, see the appropriate sections in this publication, as well as the Allen–Bradley publication 1770–4.1, (“Industrial Automation Wiring and Grounding Guidelines”), for additional installation requirements pertaining to this equipment.

ATTENTION**Preventing Electrostatic Discharge**

This equipment is sensitive to electrostatic discharge, which can cause internal damage and affect normal operation. Follow these guidelines when you handle this equipment:

- Touch a grounded object to discharge potential static.
- Wear an approved grounding wriststrap.
- Do not touch connectors or pins on component boards.
- Do not touch circuit components inside the equipment.
- If available, use a static-safe workstation.
- When not in use, keep modules in appropriate static-safe packaging.

Pre-installation Considerations

The Series B 1771-OVN dc output module is a sink output and requires a source input. A source input provides a positive voltage path and a sink output provides a path to ground.

You must use this module in a 1771-A1B, -A2B, -A3B, -A3B1, -A4B or later 1771 I/O chassis. Refer to the table below for processor compatibility.

Table A Processor Compatibility Chart

System Type	Use with Processors:
Local	Mini-PLC-2/02 (cat. no. 1772-LZ, -LZP) Mini-PLC-2/16 (cat. no. 1772-LX, -LXP) Mini-PLC-2/17 (cat. no. 1772-LW, -LWP) PLC-5/15, Series B and later (cat. no. 1785-LT)
Remote (with a 1771-ASB remote I/O adapter)	PLC-2/20 (cat. no. 1772-LP2) PLC-2/30 (cat. no. 1772-LP3) PLC-3 (cat. no. 1775-L1, -L2, -L3, -L4) PLC-3/10 (cat. no. 1775-LP4, -LP8) PLC-5/15, Series B and later (cat. no. 1785-LT)

Do not place this module in the same I/O chassis as the 1771-IX thermocouple module. You can use this module in the same chassis as the 1771-IXE thermocouple module.

Calculate Power Supply Requirements

The controller or I/O chassis power supply, connected through the backplane of the I/O chassis, powers the logic circuitry of the output modules. The maximum current drawn from this supply is 330mA.

Initial Handling Procedures

ATTENTION



Remove power from the 1771 I/O chassis backplane and field wiring arm before removing or installing an I/O module.

- Failure to remove power from the backplane or wiring arm could cause module damage, degradation of performance, or injury.
- Failure to remove power from the backplane could cause injury or equipment damage due to possible unexpected operation.

Keying the I/O Chassis

ATTENTION



A module inserted into a wrong slot could be damaged by improper voltages connected through the wiring arm. Use keying bands to prevent damage to the module.

Place your module in any slot in the chassis except the leftmost slot, which is reserved for processors or adapters.

ATTENTION



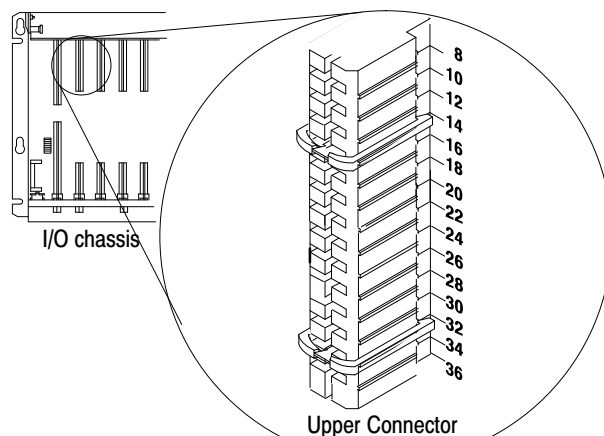
Observe the following precautions when inserting or removing keys:

- insert or remove keys with your fingers
- make sure that key placement is correct

Incorrect keying or the use of a tool can result in damage to the backplane connector and possible system faults.

Position the keying bands in the backplane connectors to correspond to the key slots on the module.

Place the keying bands:
– between 14 and 16
– between 32 and 34



You can change the position of these bands if subsequent system design and rewiring makes insertion of a different type of module necessary.

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The 1771–OVN module is a modular component of the 1771 I/O system requiring a properly installed system chassis. Refer to publication 1771–IN075 for detailed information on acceptable chassis, proper installation and grounding requirements.

Install the Module and Field Wiring Arm

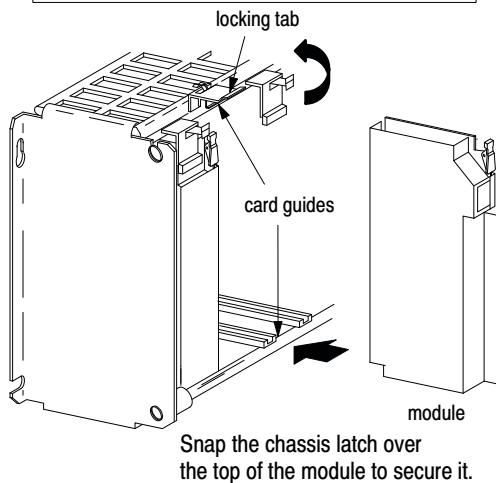
ATTENTION



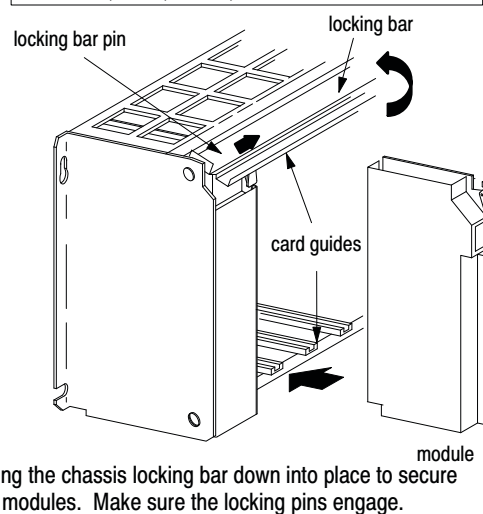
Remove power from the 1771 I/O chassis backplane and field wiring arm before removing or installing an I/O module.

- Failure to remove power from the backplane or wiring arm could cause module damage, degradation of performance, or injury.
- Failure to remove power from the backplane could cause injury or equipment damage due to possible unexpected operation.

1771-A1B, -A2B, -A3B, -A3B1, -A4B I/O chassis



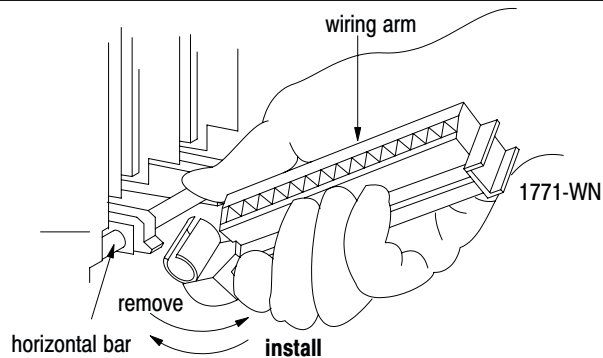
1771-A1B, -A2B, -A3B1, -A4B Series B I/O chassis



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Attach the wiring arm (1771-WN) to the horizontal bar at the bottom of the I/O chassis.

The wiring arm pivots upward and connects with the module so you can install or remove the module without disconnecting the wires.



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WARNING



If you insert or remove the module while backplane power is on, or you connect or disconnect the wiring arm with field power applied, an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure power is removed or the area is nonhazardous before proceeding.

Connect Wiring to the Module

WARNING

When you connect or disconnect the wiring arm with field power applied, an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure power is removed or the area is nonhazardous before proceeding.

ATTENTION

Remove power from the 1771 I/O chassis backplane and field wiring arm before removing or installing an I/O module.

- Failure to remove power from the backplane or wiring arm could cause module damage, degradation of performance, or injury.
 - Failure to remove power from the backplane could cause injury or equipment damage due to possible unexpected operation.
-

Make wiring connections to the module through the field wiring arm cat. no. 1771-WN. The arm pivots on the I/O chassis to connect with terminals on the front of the module and acts as a terminal strip. The wiring arm allows the module to be removed from the chassis without disconnecting wiring.

ATTENTION

The field wiring arm terminal identification number is not the same as the number of the bit which controls that output.

I/O Module Groups

Each module condenses two full module groups (32 outputs) into each I/O chassis slot. For example:

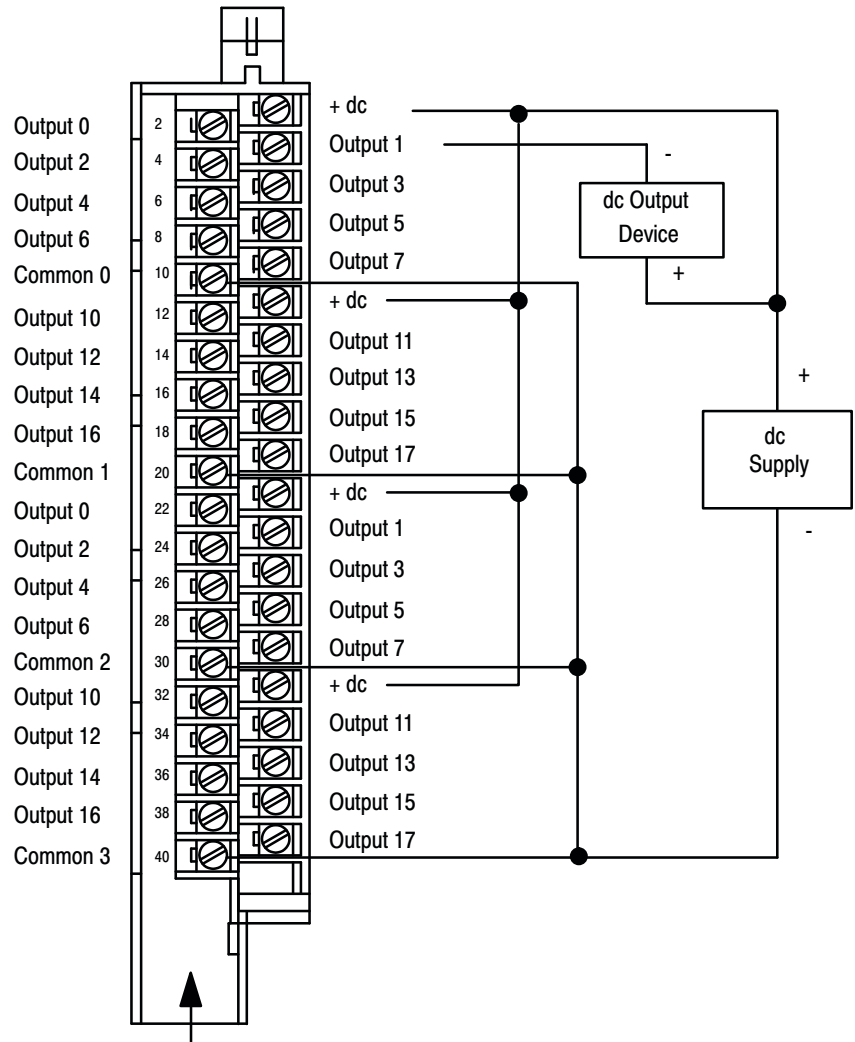
- Module group 1 = inputs 00 through 17
- Module group 2 = inputs 00 through 17 (module group 2 represents the second set of outputs).

Terminals 1 through 20 represent module group 1. Terminals 21 through 40 represent module group 2. Terminals 10, 20, 30 and 40 are DC common and terminals 1, 11, 21 and 31 are DC power.

Connection Diagram for the 1771-OVN/B DC Output Module

Note: Terminals on the left are even numbered (2 thru 40), and terminals on the right are odd numbered (1 thru 39).

Terminals 1 through 20 represent module group 1.
Terminals 21 through 40 represent module group 2.
Terminals 10, 20, 30 and 40 are dc common and terminals 1, 11, 21, and 31 are dc power.



Actual wiring runs in this direction.

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If multiple power sources are used, do not exceed the specified isolation voltage.

ATTENTION



Observe proper polarity, as indicated in the connection diagram with dc power connections. Reverse polarity, or application of ac voltage, could damage the module.

ATTENTION



Miswiring or shorting the output terminals will cause permanent damage to this module.

Table B
Module Output Terminal Assignments

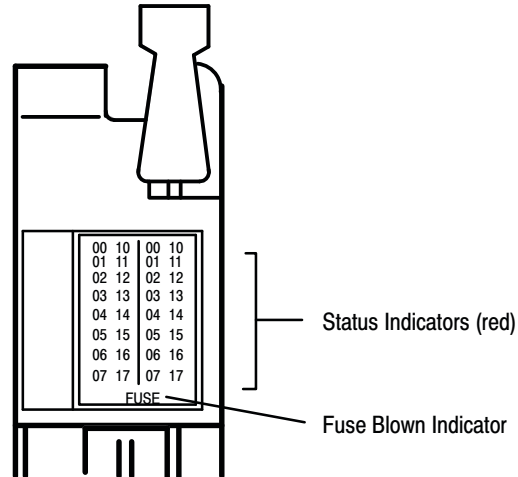
Terminal Number	Output Assignment	I/O program address	Terminal Number	Output Assignment	I/O program address
01	¹ 10 to 30V dc	-	21	¹ 10 to 30V dc	-
02	Output 00	ORG00	22	Output 00	ORG00
03	Output 01	ORG01	23	Output 01	ORG01
04	Output 02	ORG02	24	Output 02	ORG02
05	Output 03	ORG03	25	Output 03	ORG03
06	Output 04	ORG04	26	Output 04	ORG04
07	Output 05	ORG05	27	Output 05	ORG05
08	Output 06	ORG06	28	Output 06	ORG06
09	Output 07	ORG07	29	Output 07	ORG07
10	Common 0	-	30	Common 2	-
11	¹ 10 to 30V dc	-	31	¹ 10 to 30V dc	-
12	Output 10	ORG10	32	Output 10	ORG10
13	Output 11	ORG11	33	Output 11	ORG11
14	Output 12	ORG12	34	Output 12	ORG12
15	Output 13	ORG13	35	Output 13	ORG13
16	Output 14	ORG14	36	Output 14	ORG14
17	Output 15	ORG15	37	Output 15	ORG15
18	Output 16	ORG16	38	Output 16	ORG16
19	Output 17	ORG17	39	Output 17	ORG17
20	Common 1	-	40	Common 3	-

Where: R = rack number (1, 2, 3, etc.)
G = I/O group (0 - 7)

¹ You can connect a different power supply to each 10 to 30V dc terminal. They are not connected internally. Connect each common (0, 1, 2, 3) to the corresponding supply. Commons are not internally connected.

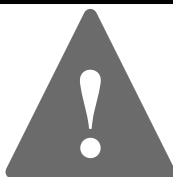
Interpreting the Status Indicators

The module has 32 status indicators on the module front plate. These represent the control status of the outputs. Each indicator is lit when its corresponding output is energized. An additional indicator is provided to indicate a blown fuse condition.



The following information applies when operating this equipment in hazardous locations:

Products marked “CL I, DIV 2, GP A, B, C, D” are suitable for use in Class I Division 2 Groups A, B, C, and D Hazardous Locations and nonhazardous locations only. Each product is supplied with markings on the rating nameplate indicating the hazardous location temperature code. When combining products within a system, the most adverse temperature code (lowest “T” number) may be used to help determine the overall temperature code of the system. Combinations of equipment in your system are subject to investigation by the local Authority Having Jurisdiction at the time of installation.

WARNING**EXPLOSION HAZARD –**

- Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous.
 - Do not disconnect connections to this equipment unless power has been removed or the area is known to be nonhazardous. Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product.
 - Substitution of components may impair suitability for Class I, Division 2.
 - If this product contains batteries, they must only be changed in an area known to be nonhazardous.
-

Informations sur l'utilisation de cet équipement en environnements dangereux:

Les produits marqués CL I, DIV 2, GP A, B, C, D ne conviennent que une utilisation en environnements de Classe I Division 2 Groupes A, B, C, D dangereux et non dangereux. Chaque produit est livré avec des marquages sur sa plaque d'identification qui indiquent le code de température pour les environnements dangereux. Lorsque plusieurs produits sont combinés dans un système, le code de température le plus défavorable (code de température le plus faible) peut être utilisé pour déterminer le code de température global du système. Les combinaisons d'équipements dans le système sont sujettes à inspection par les autorités locales qualifiées au moment de l'installation.

AVERTISSEMENT**RISQUE D'EXPLOSION –**

- Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher l'équipement.
 - Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher les connecteurs. Fixer tous les connecteurs externes reliés à cet équipement à l'aide de vis, loquets coulissants, connecteurs filetés ou autres moyens fournis avec ce produit.
 - La substitution de composants peut rendre cet équipement inadapté à une utilisation en environnement de Classe 1, Division 2.
 - S'assurer que l'environnement est classé non dangereux avant de changer les piles.
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Specifications

Outputs per module	32 (4 groups of 8)
Module Location	1771-A1B thru -A4B or later I/O Chassis
Voltage Rating	10 to 30V dc, 0.5A per output, 2A per group, 8A per module
Maximum Output Current Rating	Maximum Output Current Rating 0.5A per output (not to exceed 8A per module) 2A per output group
Maximum Surge Current	2A per output for 10ms; repeatable every 2 seconds. 5A per output group for 10ms; repeatable every 2 seconds. 20A per module for 10ms; repeatable every 2 seconds.
Maximum On-state Voltage Drop	1.5V dc at rated output current
Maximum Off-state Leakage Current	1.0mA @ 55°C
Output Signal Delay	On to off propagation delay 2.0msec Off to on propagation delay 0.1msec
Power Dissipation	13.7W (max); 1.7W (min)
Thermal Dissipation	46.7 BTU/hr (max); 5.7 BTU/hr (min)
Backplane Current	330mA @ 5V dc maximum
Isolation Voltage	Tested to withstand 500V for 60s.
Conductors Wire Size	14 AWG (2.5mm ²) to 22 AWG (0.25mm ²) (max) ¹ stranded copper rated at 60°C or greater
Category	3/64 inch (1.2mm) insulation (max) 2 ²
Environmental Conditions	
Operating Temperature	IEC 60068–2–1 (Test Ad, Operating Cold) IEC 60068–2–2 (Test Bd, Operating Dry Heat) IEC 60068–2–14 (Test Nb, Operating Thermal Shock) 32 to 104°F (0° to 40°C)
Storage Temperature	IEC 60068–2–1 (Test Ab, Unpackaged, Nonoperating Cold) IEC 60068–2–2 (Test Bb, Unpackaged, Nonoperating Dry Heat) IEC 60068–2–14 (Test Na, Unpackaged, Nonoperating Thermal Shock) –40 to 185°F (–40 to 185°F)
Relative Humidity	IEC 60068–2–30 (Test Db, Unpackaged, Nonoperating Damp Heat) 5 to 95%, noncondensing
Shock Operating Nonoperating	IEC 60068–2–27 (Test Ea, Unpackaged Shock) 30g 50g
Vibration	IEC 60068–2–6 (Test Fc, Operating) 2g @ 10–500Hz
ESD Immunity	IEC 61000–4–2 4kV indirect discharges
Radiated RF Immunity	IEC 61000–4–3 10V/m, 3V/M Broadcast Bands, with 1kHz sine-wave 80% AM from 30MHz to 1000MHz
EFT/B Immunity	IEC 61000–4–4 +1kV @ 5kHz on signal ports
Surge Transient Immunity	IEC 61000–4–5 +1kV line–line (DM) and +2kV line–earth (CM) on signal ports
Conducted RF Immunity	IEC 61000–4–6 10V rms with 1kHz sine wave 80% AM from 150kHz to 30MHz

Specifications continued on next page.

Specifications (cont.)

Emissions	CISPR 11 Group 1, Class A (with appropriate enclosure)
Enclosure Type Rating	None (open-style)
Keying	Between 14 and 16 Between 32 and 34
Fuse	Four 4.0A, 250V normal blow fuses (1 per group); SAN-O Corporation ST4-4.0A
Field Wiring Arm	Catalog Number 1771-WN
Wiring Arm Screw Torque	9 pound-inches (1.0Nm)
Certifications (when product is marked)	UL UL Listed Industrial Control Equipment CSA CSA Certified Process Control Equipment CSA CSA Certified Process Control Equipment for Class I, Division 2 Group A, B, C, D Hazardous Locations CE ³ European Union 89/336/EEC EMC Directive, compliant with: EN 61000-6-2, Industrial Immunity EN 61000-6-4, Industrial Emissions EN 50082-2, Industrial Immunity EN 61326, Meas./Control/Lab., Industrial Requirements C-Tick ³ Australian Radiocommunications Act, compliant with: AS/NZS 2064, Industrial Emissions

¹ 14 gauge wire connected to all terminals may not allow the cover on the field wiring arm to close. A smaller gauge wire may be used.

² You use this conductor category information for planning conductor routing as described in publication 1770-4.1, Industrial Automation Wiring and Grounding Guidelines.

³ See the Product Certification link at www.ab.com for Declarations of Conformity, Certificates and other certification details

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